THE STATUS OF AGALINIS CADDOENSIS PENNELL

D. T. MacRoberts
Louisiana State University in Shreveport

Abstract: Agalinis caddoensis Pennell is classified as "threatened" on the Smithsonian list. This species is known only from the type collection in 1913.

After an examination of Pennell's collection I conclude that Agalinis caddoensis is not sufficiently distinguishable from Agalinis strictifolia (Bentham) Pennell to justify its classification as a separate species.

There is no reason to continue the classification of Agalinis caddoensis as "threatened".

Agalinis caddoensis Pennell appears on the Smithsonian list of "endangered and threatened plant species", categorized as "threatened". Using the definitions given by the Smithsonian report, this classification seems wrong. The taxon should either be "endangered" or "possibly extinct". For an endangered species is ". . in danger of extinction. . "; or . . ", one which is found in a very limited area " . . e.g. the type locality only . ." while an extinct species is " . . . no longer known to exist after repeated search of the type locality and other known or likely places."

A. caddoensis was found but once, in one locality, and has not been seen in over 60 years. The type locality has long since been absorbed within a metropolitan area and extensive search in known or likely places has been unproductive.

The Smithsonian report emphasizes (p. 18) that once a plant appears on such a list it is subject to the question: "Is the plant species . . a valid taxon? Perhaps it is a . . non-valid segregate of a more common species." I believe this order is wrong: the status should be established before it appears on such a list. The category "taxonomic status in doubt" is, for some reason, applied only to the "extinct" list.

Since the type (and only) location of A. caddoensis was within ten miles of the LSU-S campus in Shreveport, we were well aware of the possibility of finding the species. Correll & Johnston (1970), with quite unfounded optimism, had reported it as ". . undoubtedly in northeast Texas (no material seen)". Fairly intensive collecting between 1970 and 1977 had produced nothing which could not be assigned, with the assurance one can bring to this difficult genus, to one of the common species of the area where they are abundant members of the fall flora.

The problem, however, was but one among many involved in setting up a new herbarium and making an initial collection from the relatively untouched area of northwestern Louisiana.

The matter was called to our attention more forcefully in the spring of 1977 by inquiries which were related to an environmental impact study for an airport extension in north Louisiana: would the construction further endanger the species? All we could tell them at the time was that the plant had not been collected for over a half century, that the type location was some 70 miles from the proposed construction and that we considered the chances of destroying any plants or their habitat as nugatory. But, during the spring, there was little more we could tell them.

I do not know whether this information was enough to satisfy whatever agency was raising the question but the true status of the species seemed worth investigation.

Agalinis Rafinesque (Gerardia L., in part).

Rafinesque divided the Linnaean genus Gerardia into three: Aureolaria, Tomanthera and Agalinis. Most authors, not all, observe the division but there is no agreement about the name Agalinis, many preferring Gerardia. Pennell (1886-1952), on whose work the present treatments of Agalinis are based, vacillated between the two. The result has been a proliferation of unnecessary synonyms and general confusion. Thus the recent "Checklist of Species for Flora North America" (1978) divides the species randomly between Agalinis and Gerardia and includes some names in synonomy. I will use Agalinis throughout.

Pennell attempted to cover the entire Scrophulariaceae of eastern temperate North America (but including at least part of Mexico) and Agalinis made up but a small part of that work. His final summary of Agalinis (as Gerardia) is exceedingly wearisome to study with its many references back to his previous publications. Aside from his use of trinomials, some of his nomenclature would not be permissible today and his reference to previously named species which do not appear in his synonomy is irritating. I begrudge noone the task of revising this monograph.

Agalinis caddoensis Pennell

Agalinis caddoensis Pennell, sp. nov. in Proc. Acad. Nat. Sci. Phil., 1921, Part III, 519.

Gerardia caddoensis (Pennell) Pennell, comb. nov. in: "Scrophulariaceae of Eastern Temperate North America", Acad. Nat. Sci. Phil., Monograph 1, 449 (1935).

Type: Pennell 5653 (sic) PENN): dry loam oakwoods along Kansas City Southern Railroad 2-3 miles northwest of Shreveport,

Caddo Parish, Louisiana; collected in flower October 5m 1913.
Other collections: Louisiana, Caddo: Shreveport, Pennell 5655, 5658, 5665.

Pennell's citation must be erroneous: there appears to be no collection numbered 5653. Requests to PH (where the PENN collections are now found) and US brought examples of the other three numbers but not 5653. Moreover, Pennell 5658 (PH 61211) is labeled "Type" in the same handwriting as all the labels while duplicates (PH 554846 and US 588124) are labeled "Isotype". Pennelll 5655 was collected at the same location (or one with an identical description) but on the day previous.

Pennell 5665 was collected on Oct. 5, 1913 in "mixed woods, 4-5 miles south of Shreveport, Caddo Parish, Louisiana along Cedar Grove trolley." This is about seven miles south of the type location but the specimen is clearly Agalinis gattingeri (Small) Small, a fairly common species of the area but hardly one to comfuse with the Setacea.

There are other disturbing errors in Pennell's work. The original date of the journal in which A. caddoensis was first published is repeatedly given as 1922 instead of the correct 1921. And quite by chance I noticed that the specimen Runyon 195 was cited, in 1935, as both Gerardia maritima grandiflora Benth. and Gerardia strictifolia Benth. with no "in part" indicated.

Pennell placed A. caddoensis in Section Chytra, Subsection Setacea. The only species in Setacea which might be found in northwestern Louisiana are Agalinis pulchella Pennell (Gerardia pulcherrima Pannell, not Gerardia pulchella Pennell), and Agalinis strictifolia (Bentham) Pennell. A. caddoensis is certainly not A. pulchella which has well developed axillary fascicles. A. caddoensis and A. strictifolia are closely related and Pennell separated them in his key on the basis of calyx lobe length.

Correll & Johnston (1970) follow Pennell closely but are led into error by Pennell's key: they add a differentiation between these two based upon the intra-cellular seed area. Since Pennell did not collect A. caddoensis in fruit this character is shown, in his key, as "unknown". Correll & Johnston saw no material and could not have added the diagnostic.

The close resemblance and difficulty of separation of these two taxa are shown by the following table:

	A. strictifolia	A. caddoensis
Height	5-8 dm.	4-6 dm.
Stem	striate, glabrous	striate, very slightly scabrous
Leaves	2-3½ cm. linear-subulate 1-3 mm wide	2½-3 cm. filiform, acuminate .8 mm wide
Racemes	4-10 flowered	1-5 flowered
Pedicels	ascending, spreading	ascending, spreading
Pedicel length	1-2½ cm.	1.3 - 2.2 cm.
Calyx tube	3-4 mm	4-5 mm
Calyx lobes	1-2 mm	.7 -1 mm
Corolla length	2-2½ cm.	2-3 cm.
Corolla tube	12-15 mm	19-23 mm
Corolla lobes	8-10 mm	6-7 mm

Some of these measurements imply an exactitude completely unobtainable in living material and statistically meaningless on such a small sample.

After a preliminary check with the major herbaria of the area (SMU, TEX, UARK, LSU, NLU) which produced no specimens of the taxon, specimens of Pennell's collections, except for the questionable 5653, were obtained from PH and US. SMU kindly furnished specimens of the species expected in this area, supplementing our own collections at LSUS.

Careful measurement of the calyx lobes did not show the differences described by Pennell. While the lobes of A. strictifolia might average slightly longer than those of A. caddoensis the difference was of the order of .1 - .2 mm, entirely insufficient in this variable character to separate species. Similarly, the difference in corolla tube length could not be observed; indeed, the tubes of A. caddoensis appeared. if anything, to be shorter than those of A. strictifolia, exactly opposite to the descriptions.

Only one difference of significance could be found: the leaves of A. caddoensis were definitely narrower than those of A. strictifolia, although so highly involute as to obscure the actual width.

All these comparisons were made on south Texas specimens of A. strictifolia since the species is not known from northern

Texas or Louisiana. Pennell cited one specimen (Palmer 14383) (MO) from near Palestine, Anderson County, Texas, about 120 miles southwest of the Louisiana location of A. caddoensis. This specimen and one of Pennell's collections (Pennell 5431, MO) were borrowed from MO. The Palmer collection was typical A. strictifolia similar to those from extreme south Texas. The Pennell specimen, however, was not A. strictifolia and did not even closely resemble that species. It is probably Agalinis oligophylla Pennell (Gerardia microphylla (Gray) Small, not Agalinis microphylla Raf.)

D. A. Webb (1978) has set out two criteria which guided the group who prepared Flora Europea:

First, that for two taxa to be regarded as distinct species they must differ in morphology clearly enough for it to be possible to key them out honestly and unambiguously, by characters of which at least one shows no overlap in normal, well-developed specimens.

Secondly, that one differential character is not enough, it must be backed up by others, even if these admit some overlap.

A. caddoensis might be said to pass the first test, though barely. The abundant and widespread species A. tenuifolia (Vahl) Raf. shows more variation among its varieties in both leaf width and calyx tube length than those adduced to support the separation of A. caddoensis and A. strictifolia. But A. caddoensis certainly does not pass the second; there is no set of characters, even overlapping, which can serve to distinguish it from A. strictifolia, honestly and unambiguously. To be sure, part of the difficulty is inherent in the limited number of specimens available and our inability to acquire more. Living material might well show variation which is not visible on herbarium sheets. But we do not know that Pennell worked from such material since he did not describe until 1921 a collection made in 1913.

While A. strictifolia isno more a normal member of northwestern Louisiana's flora than is A. caddoensis, the location of Pennell's collections: along the KCS railroad suggests a purely adventive origin.

This examination of available material leads me to these conclusions:

1. The reported Agalinis caddoensis Pennell does not differ from Agalinis strictifolia (Bentham) Pennell to justify its designation as a separate species.

2. Neither species is normally found in northwest Louisiana.

3. The solitary population along a railroad track suggests an adventive distribution of the taxon.

4. There is no reason, at present, to include A. caddoensis in a list of endangered plants. If listed at all it should be as "taxonomically doubtful, probably extinct".

Specimens examined:

Agalinis caddoensis	Pennell 5658 (type, PH) 5658 (isotype, PH) 5658 (isotype, US) 5655 (PH)
Agalinis strictifolia	Palmer 14383 (MO) Runyon 5227, 5224, 5232 (SMU) Williams 62 (SMU) Jones 716 (SMU) Johnson 1008 (SMU) Johnston 541517 (SMU)
Agalinis oligophylla	Pennell 5431 (MO) (as A. strictifolia)
Agalinis gattingeri	Pennell 5665 (PH) (as A. caddoensis) Shinners 9485, 16346 (SMU) Moore 1045 (SMU) MacRoberts 746, 2583 (LSUS)

References

_____ Report on Endangered and Threatened Plant Species of the United States, Simthsonian Institution, 15 December, 1974. 94th Congress, 1st session, - - House Document No. 94-51. U. S. government Printing Office, Washington, 1975.

Correll, D. S. & M. C. Johnston, 1970. Manual of the Vascular Plants of Texas. Texas Research Foundation, Renner.

Pennell, F. W. 1921: Proc. Acad. Nat. Sci. Phil. Part III, 519.

_____ 1929: Proc. Acad. Nat. Sci. Phil., Vol. LXXXI, 185.

_____ 1935: The Scrophulariaceae of Eastern Temperate North America. Acad. Nat. Sci. Phil. Monograph 1, Philadelphia.

Shetler, S. G. & L. E. Skogs, Eds. 1978: A provisional Checklist of Species for Flora North America (revised), Missouri Bot. Gar. St. Louis.

Webb, D. A. 1978: Taxon (27) 1, 5.